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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/799,444 | 03/12/2004 | Boyd T. Tolton | LAMA122586 | 6250 |
| 26389 | 7590 | 02/13/2006 | | EXAMINER |
| | | | | MALEVIC, DJURA |
| | | | ART UNIT | PAPER NUMBER |
| | | | | 2884 |

DATE MAILED: 02/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|---------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/799,444 | TOLTON ET AL. | |
| | Examiner Djura Malevic | Art Unit 2884 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 12 March 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-27 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 12 March 2004 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>4/14/05 & 7/28/05</u> | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,5,11,12,13,15,16,18,24,25, and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Nelson *et al.* (US Patent 6,750453 B1).

With regards to claim 1, Nelson discloses a method of detecting gases in the free atmosphere comprising traversing a target area with a gas correlation radiometer (GCR) tuned to detect the presence of ethane and identifying a gas leak upon a gas filter correlation radiometer (Col. 4, Line 59; Col. 1, Line 30++; Col. 21, Line 62).

With regards to claims 5 and 18, Nelson discloses a gas filter correlation radiometer (Figure 1) comprising a window 63 in a housing, optics defining a first 78 and second 76 optical paths between the window 63 and the detectors 82 and 86, a beam splitter 72 as part of the optics for directing radiation from the window 63 and dividing the radiation between optical paths, ethane optical paths being different lengths from each other and electronics 88 and 89 for processing signals from the detectors 82 and 86.

With regards to claims 11 and 24, Nelson discloses an optical path provided with a gas filter containing ethane (Col. 10, Line 64++; Col. 21, Line 4; Col. 21, Line 62).

With regards to claims 12 and 25, Nelson discloses two optical paths with different lengths capable of detecting ethane (Col. 10, Line 64++; Col.21, Line 4; Col. 21, Line 63).

With regards to claims 13 and 26, Nelson discloses two detectors 82 and 86 having collocated fields of view and sampled synchronously (Figure 1), (Col. 21, Line 62).

With regards to claim 15, Nelson discloses mounting the correlation radiometer on an airborne vehicle (Fig 19).

With regards to claim 16, Nelson discloses the gas leak located along a pipeline (Col. 1, Line 30++).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2,3,4,7,8,9, rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. (US Patent 6,750,453 B1).

With regards to claims 2, 3, 4, 7,8, and 9, Nelson discloses a method of detecting gas leaks as claimed in claims 1 and 5, and further discloses that the gas filters are configured for ethane, such that the optimized central wavelength and the optimized band-pass provides substantially increased sensitivity to the ethane gas and substantially increases selectivity of the ethane gas. Furthermore, Nelson discloses that the said filter consists of a specific band-pass and central wavelength, which avoids erroneous detection of any competitive gases (other than ethane). The said filter responds to wavelengths with a

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band corresponding to strong absorption by the specific target (ethane). Moreover, Nelson discloses filters for ethane comprising a band of 2970 to 3005 cm⁻¹ and a process for obtaining an ethane-optimal central wavelength to increased sensitivity to ethane as the target gas. Nelson does not expressly disclose the absorption peak at 3000cm⁻¹, the absorption peak at a bandwidth of 2850 to 3075cm⁻¹ and an absorption peak at a bandwidth up to 150 cm⁻¹ above or below 3000cm⁻¹ (Col.13, Line 61; Col. 21, Line 3; Col. 21, Line 62).

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include the absorption peak at 3000cm⁻¹, the absorption peak at a bandwidth of 2850 to 3075cm⁻¹ and an absorption peak at a bandwidth up to 150 cm⁻¹ above or below 3000cm⁻¹, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Claims 6,10, 19, 20 - 23 rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. in view of Sache et al. (US Patent 6,574,031).

With regards to claims 6 and 19, Nelson discloses the method of detecting gas leaks and a gas filter as claimed in claims 5 and 18 but does not expressly disclose the beam splitter comprising a prism. However, Sache teaches that partitioning may be accomplished in a number of ways including utilizing a prism (Col.4, Line 8). Nelson and Sache are analogous art because they are both from the similar problem solving area, gas detection.

Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Nelson to include a prism such as that taught by Sache, since prisms are known for partitioning.

With regards to claim 10, Nelson in view of Sache discloses a method of detecting gas leaks as claimed in claim 6 and Nelson further discloses that the gas filters are configured for ethane, such that the optimized central wavelength and the optimized band-pass provides substantially increased sensitivity to ethane gas and substantially increases selectivity of the ethane gas. Furthermore, Nelson discloses that the said filter consists of a specific band-pass and central wavelength, which avoids erroneous detection of any competitive gases (other than ethane). The said filter responds to wavelengths with a band corresponding to strong absorption by the specific target (ethane). Moreover, Nelson discloses filters for ethane comprising a band of 2970 to 3005 cm⁻¹ and a process for obtaining an ethane-optimal central wavelength to increased sensitivity to ethane as the target gas. Nelson does not expressly disclose the absorption peak at 3000cm⁻¹ (Col.13, Line 61; Col. 21, Line 3; Col. 21, Line 62).

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include the absorption peak at 3000cm⁻¹, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

With regards to claims 14 and 27, Nelson discloses the method for detecting gas leaks as claimed in claim 5 but does not expressly disclose using a pushbroom imaging technique. However, Nelson discloses detecting in a direction perpendicular to the ground surface while moving in an aircraft, thus it is obvious that Nelson is using a pushbroom technique.

With regards to claims 20 - 23, Nelson discloses the correlation radiometer as claimed in claim 18 and further discloses that the gas filters are configured for ethane, such that the optimized central wavelength and the optimized band-pass provides substantially increased sensitivity to ethane gas and substantially increases selectivity of the ethane gas. Furthermore, Nelson discloses that the said filter

consists of a specific band-pass and central wavelength, which avoids erroneous detection of any competitive gases (other than ethane). The said filter responds to wavelengths with a band corresponding to strong absorption by the specific target (ethane). Moreover, Nelson discloses filters for ethane comprising a band of 2970 to 3005 cm⁻¹ and a process for obtaining an ethane-optimal central wavelength to increased sensitivity to ethane as the target gas. Nelson does not expressly disclose the absorption peak at 3000cm⁻¹, the absorption peak at a bandwidth of 2850 to 3075cm⁻¹ and an absorption peak at a bandwidth up to 150 cm⁻¹ above or below 3000cm⁻¹ (Col.13, Line 61; Col. 21, Line 3; Col. 21, Line 62).

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include the absorption peak at 3000cm⁻¹, the absorption peak at a bandwidth of 2850 to 3075cm⁻¹ and an absorption peak at a bandwidth up to 150 cm⁻¹ above or below 3000cm⁻¹, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson in view of Smith et al. (US Patent 6,756,592 B1).

With regards to claim 17, Nelson discloses the method for detecting gas leaks as claimed in claim 1 but does not expressly disclose the gas leak detected as part of reservoir mapping process. References such as Smith et al. (US Patent 6,756,592 B1) teach high-resolution maps showing the distribution of gas leaks (Col. 3, Line 36) (Figure 1). Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to modify Nelson to include the mapping system such as that taught by Smith because mapping gas leaks would increase the users understanding of the area.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Spoonhower et al. (US Pub 20040088113 A1) teaches a method for detecting gas in pipeline failures.

Sachse et al (US Patent 6,008,928) teaches a multi-gas sensor. Laufer (US Patent 6,853,452 B1) teaches a sensor having two optical paths.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Djura Malevic whose telephone number is 571.272.5975. The examiner can normally be reached on Monday - Friday between 8:30am and 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DAVID PORTA
SUPERVISORY EXAMINER
TECHNOLOGY CENTER 2800

Djura Malevic
Patent Examiner
Art Unit 2884
571.272.5975